Comments on ARB Scoping Plan

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Analysis in the attached working paper suggests California is at considerable risk of missing the 2030 target without more and stronger regulatory measures and/or significantly raising the cap-and-trade ceiling price.

A recent Energy Institute study estimates a 30% chance of hitting a $80/tCO2 cap-and-trade ceiling price, while a study using the REMI model study suggests a $200/tCO2 price would be needed to meet the 2030 target. However, California already has a natural experiment of the equivalent of a $200/tCO2 carbon tax on gasoline, and it failed to noticeably reduce emissions from transportation, the largest source of California’s GHG inventory. From 2003 to 2012 a $2/gallon increase in gasoline fuel prices (equivalent to $200/tCO2e tax) correlated with only a 10% decrease in gasoline consumption in California. Yet the timing of this 10% reduction corresponds much more closely with the “Great Recession” than with fuel prices. Over this decade fuel economy standards were also reducing fuel consumption.



Gasoline prices (real USD) and long-distance vehicle (LDV) miles and fuel consumption per capita. An equivalent of $200/tCO2 carbon tax resulted in only ~10% decrease in fuel consumption over 5 years (2007-2012), with much of this change evidently caused by the economic crisis, not fuel prices.

Based on this evidence, the Energy Institute study, the REMI study, and ARB’s own analysis appear to overestimate the effect of carbon prices on emissions. The Energy Institute Study assumes an elasticity of -0.2 – 0.4, while the REMI study assumes even higher demand elasticities. California’s own experience demonstrates a medium-term elasticity of demand at far less than -0.1. In fact, the [EIA](https://www.eia.gov/todayinenergy/detail.php?id=19191) suggests demand elasticities at -0.02 to -0.04 in the short term, i.e., it takes a 25% to 50% increase in fuel prices to reduce gasoline consumption by just 1%. As a consequence, even a $200/tCO2 may have only a negligible effect on fuel consumption.

Sperling et. al suggest some reasons why the economic literature and economic models routinely overestimate the impact of fuel prices and carbon taxes on fuel consumption. Some of the reasons include consumer preferences, lack of substitutes and structural forces. Studies on price elasticities are also often outdated or focused on Europe or other countries were baseline prices are higher (elasticities are higher at higher prices).

Rather than relying on floor and ceiling prices, banking, carbon offsets or other distortions to a purely market-based approach, our analysis suggests that increasing regulatory measures would decrease economy-wide costs, while reducing the total number of permits needed in cap-and-trade and decreasing the chance of hitting the ceiling price. We constructed marginal abatement cost curves of the ARB Scoping Plan Scenario, the Alternative 1 scenario, and our own proposed scenario under different fuel prices. Some of the approaches we propose have been considered, but abandoned by ARB, while others are somewhat newer and more novel.

Regardless of the mix of regulatory approaches, more are clearly needed to ensure California meets it target. California needs roughly 5% annual GHG abatement for the next 30 years to meet our 2030 and 2050 GHG targets. This is equivalent to the effect the Great Recession, compounded upon itself every year for thirty years, while increasing GDP and population. More attention is clearly needed on actual, measurable regulatory approaches at all levels of government, including local, regional and state action.

City References:

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